



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/740,016	12/20/2000	Shi-Tron Lin	06484.0074	4271

22852 7590 04/24/2002

FINNEGAN, HENDERSON, FARABOW, GARRETT &
DUNNER LLP
1300 I STREET, NW
WASHINGTON, DC 20005

EXAMINER

NADAV, ORI

ART UNIT	PAPER NUMBER
----------	--------------

2811

DATE MAILED: 04/24/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/740,016

Applicant(s)

LIN ET AL.

Examiner

ori nadav

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-122 is/are pending in the application.
- 4a) Of the above claim(s) 1-82 and 93-95 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 83-92 and 96-122 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: _____

Art Unit: 2811

DETAILED ACTION

Election/Restriction

1. Applicant's election of the embodiment of figure claims 83-92 and 96-122 in Paper No. 8 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Oath/Declaration

2. The oath/declaration filed on 12/20/2000 is acceptable.

Drawings

3. The formal drawings filed on 12/20/2000 are acceptable.

Information Disclosure Statement

4. The Information Disclosure Statement filed on 12/20/2000 has been considered.

Art Unit: 2811

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 100, 112-113 and 121-122 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

7. There is no support in the embodiment of figure 24 for at least first segment formed of a conductive layer over a dielectric layer and for each segment being closer to the channel than to the contact region, as recited in claims 100, 112 and 121, respectively.

8. There is no support in the embodiment of figure 24 for the largest dimension of each segment being less than 4.5 and 2.5 times a length of the channel, as recited in claims 117 and 118, respectively.

Art Unit: 2811

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

10. Claims 83-84, 87-89, 91, 92, 98, 101-109, 112-116 and 119-122, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 102(e) as being anticipated by Hsu et al. (6,236,073).

Hsu et al. teach in figure 5 an electrostatic discharge protection device, comprising: a substrate 120 (figure 4); a first diffusion region 122 formed in the substrate; a second diffusion region 124 formed in the substrate adjacent to and spaced from the first diffusion region; plurality of contacts contact 130 for making a conductive connection to the first diffusion region; a channel (the area under gate 126) formed in a third region between the first and second diffusion regions; and a plurality of current divider segments 140 unevenly distributed within the first diffusion region, wherein the different shapes are selected from a square, a circle, a cross shape, a T shape, a V shape, a U shape, and an L shape, and the plurality of segments includes a first row of segments; each one of the first row of segments has a center-of-area, the respective centers-of-area being one of aligned or not aligned, wherein the plurality of segments

Art Unit: 2811

are formed of polysilicon segments, field oxide segments, or a combination of polysilicon and field oxide segments, and wherein the segments include a first segment spaced apart by a first gap from an adjacent second segment; the segments further include a third segment spaced apart by a second gap from an adjacent fourth segment; and the first gap being larger than the second gap, wherein the second segment is the third segment, a dielectric layer 125 formed over the channel, a conductive element 126 formed over the dielectric layer, wherein the conductive element is a polysilicon gate element; and the dielectric layer is an oxide layer, wherein at least one of the segments is positioned between the at least one contact and the channel.

Regarding the claimed limitation of "unevenly distributed", the examiner must give claims their broadest reasonable interpretation in light of the supporting disclosure. See, e.g., *In re Zletz*, 893 F.2d 319, 321 - 22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow . . .") The embodiment of figure 24 does not define the term "unevenly". The broadest definition of the term "unevenly" means "not being in the same line". Hsu et al. teach a plurality of current divider segments 140 not being in the same line within the first diffusion region. Therefore, Hsu et al. teach a plurality of current divider segments 140 unevenly distributed within the first diffusion region, as claimed.

Art Unit: 2811

Regarding claims 89 and 119, Hsu et al. teach a plurality of current divider segments 140 evenly and unevenly distributed within the first diffusion region and having a first portion oriented at an angle to the channel region.

Regarding claim 98, Hsu et al. teach first and second segments formed in different orientations with respect to a drain contact.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 83-92 and 96-122, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (5,721,439)

Lin teaches in figure 8 an electrostatic discharge protection device, comprising: a substrate; a first diffusion region 87 formed in the substrate; a second diffusion region 88 formed in the substrate adjacent to and spaced from the first diffusion region; plurality of contacts contact 97 (figure 9) for making a conductive connection to the first diffusion region; a channel (the area under gate 80) formed in a third region between

Art Unit: 2811

the first and second diffusion regions; and a plurality of current divider segments 84, 85, 86 unevenly distributed within the first diffusion region, wherein the different shapes are selected from a square, a circle, a cross shape, a T shape, a V shape, a U shape, and an L shape, and the plurality of segments includes a first row of segments; each one of the first row of segments has a center-of-area, the respective centers-of-area being one of aligned or not aligned, wherein the plurality of segments are formed of polysilicon segments, field oxide segments, or a combination of polysilicon and field oxide segments, and wherein the segments include a first segment spaced apart by a first gap from an adjacent second segment; the segments further include a third segment spaced apart by a second gap from an adjacent fourth segment; and the first gap being larger than the second gap, wherein the second segment is the third segment, a dielectric layer 125 formed over the channel, a conductive element 126 formed over the dielectric layer, wherein the conductive element is a polysilicon gate element; and the dielectric layer is an oxide layer, wherein at least one of the segments is positioned between the at least one contact and the channel.

Regarding the claimed limitation of "unevenly distributed", the examiner must give claims their broadest reasonable interpretation in light of the supporting disclosure.

See, e.g., *In re Zletz*, 893 F.2d 319, 321 - 22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow . . .") The embodiment of figure 24 does not define the term

Art Unit: 2811

“unevenly”. The broadest definition of the term “unevenly” means “not being in the same line”. Although Lin states that the plurality of current divider segments 85, 86 are evenly distributed in the drain region, Lin’s definition of ‘evenly distributed’ is different from the one of the claimed invention. Therefore, although Lin categorized the plurality of current divider segments 84, 85, 86 as evenly distributed, the plurality of current divider segments 85, 86 are not evenly distributed in the same line within the first diffusion region. Therefore, Lin teaches a plurality of current divider segments 84, 85, 86 unevenly distributed within the first diffusion region, with respect to the broadest interpretation of the claims, as claimed.

Lin does not teach in figure 8 plurality of contacts. Lin teaches in figure 9 plurality of contacts. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use plurality of contacts in the device of figure 8 in order to operate the device. Note that the device would not operate without contacts.

Regarding claims 89 and 119, Lin teaches a plurality of current divider segments 140 evenly and unevenly distributed within the first diffusion region and having a first portion oriented at an angle to the channel region.

Regarding claim 98, Lin teaches first and second segments formed in different orientations with respect to a drain contact.

Art Unit: 2811

Regarding claims 86, 90, 117-118, Lin teaches substantially the entire claimed structure, as applied to claim 1 above, except stating that the largest dimension of each segment is less than or equal to substantially six times a length of the channel.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the largest dimension of each segment being less than or equal to substantially six times or 2.5 times a length of the channel in Lin's device, since it is within the skills of an artisan to adjust the dimension of each segment, subject to routine experimentation and optimization.

Regarding claims 85 and 96-97, Lin teaches in figure 8 different shapes 85, 86 differ from each other with respect to at least one of length, width, size, and area.

Regarding claims 99-100, Lin teaches segments include a first segment formed of a polysilicon layer over a dielectric layer (figure 4); and the second segment 86 formed by a LOCOS process of a field oxide layer (figure 8). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the first segment formed of a polysilicon layer over a dielectric layer; and the second segment formed of a field oxide layer in Lin's device in order to provide better ESD protection to the device.

Art Unit: 2811

13. Claims 86, 90, 117-118 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al.

Regarding claims 86, 90, 117-118, Hsu et al. teach substantially the entire claimed structure, as applied to claim 1 above, except stating that the largest dimension of each segment is less than or equal to substantially six times a length of the channel.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the largest dimension of each segment being less than or equal to substantially six times or 2.5 times a length of the channel in Hsu et al.'s device, since it is within the skills of an artisan to adjust the dimension of each segment, subject to routine experimentation and optimization.

14. Claims 85, 96, 97, 99, 100, 110-111, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al. in view of Lin.

Regarding claims 85 and 96-97, Hsu et al. teaches substantially the entire claimed structure, as applied to claim 1 above, except the different shapes differ from each other with respect to at least one of length, width, size, and area.

Lin teaches in figure 8 different shapes 85, 86 differ from each other with respect to at least one of length, width, size, and area.

Art Unit: 2811

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use different shapes differ from each other with respect to at least one of length, width, size, and area in Hsu et al.'s device in order to provide better ESD current distribution. The combination is motivated by the teaching of Lin who points out the advantages of using shapes different from each other with respect to at least one of length, width, size, and area.

Regarding claims 99-100, Hsu et al. do not teach a second segment formed of a field oxide layer. Lin teaches segments include a first segment formed of a polysilicon layer over a dielectric layer (figure 4); and the second segment 86 formed by a LOCOS process of a field oxide layer (figure 8). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the first segment formed of a polysilicon layer over a dielectric layer; and the second segment formed of a field oxide layer in Hsu et al.'s device in order to provide better ESD protection to the device.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reference N is cited as being related to current dividers.

Art Unit: 2811

Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is **(703) 308-8138**. The Examiner is in the Office generally between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas, can be reached at **(703) 308-2772**.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **308-0956**

Ori Nadav

April 22, 2002

Steven Loke
Primary Examiner

